Rapid Assessment Reference Condition Model

The Rapid Assessment is a component of the LANDFIRE project. Reference condition models for the Rapid Assessment were created through a series of expert workshops and a peer-review process in 2004-2005. For more information, please visit www.landfire.gov. Please direct questions to helpdesk@landfire.gov.

Potential Natural Vegetation Group (PNVG):

R7SESF **Southeastern Red Spruce - Fraser Fir**

General Information

Contributors *(additional contributors may be listed under "Model Evolution and Comments")*

Modelers		Reviewers	
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Vegetation Type

Forested

Dominant Species*

ABFR
PIRU
BEAL2

General Model Sources

- [x] Literature
- [ ] Local Data
- [x] Expert Estimate

LANDFIRE Mapping Zones

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Rapid Assessment Model Zones

- [ ] California
- [ ] Great Basin
- [ ] Great Lakes
- [x] Northeast
- [ ] Northern Plains
- [ ] N-Cent.Rockies
- [ ] Pacific Northwest
- [ ] South Central
- [ ] Southeast
- [ ] S. Appalachians
- [ ] Southwest

Geographic Range

Mountains from WV and VA to NC; southern limit is Richard Mountain in the Balsam Fir range in NC and the central Smoky Mountains along the NC-TN border and Cowee Bald in the Cowee Range. The northern limit is south of the Maryland border.

Biophysical Site Description

Stands are found at middle to high elevations, usually on the highest mountains, capping the highest peaks. Occurs in the Central Appalachian Broadleaf-Coniferous and Forest Meadow ecological provinces, and the Northern Ridge and Valley and Blue Ridge Mountain ecological sections. Generally site conditions are poor, with short frost-free seasons and shallow, poorly developed, easily eroded soils on steep slopes. Sites are frequently foggy and cloud contact may account for significant moisture.

This type would have dominated the landscape throughout with inclusions of other forest types in wetter spots, or at higher elevations. There is strong evidence indicating that species occurrence largely dominated sandy soils or glacial moraines.

Vegetation Description

Montane and allied spruce and spruce-fir forest. Stable, uneven-aged forest with canopy dynamics dominated by gap-phase regeneration on a fine scale. Dominant species are Fraser fir (Abies fraseri) and/or red spruce (Picea rubens). Other common associates include yellow birch (Betula allegheniensis), mountain ash (Sorbus americana), mountain maple (Acer spicatum), pin cherry (Prunus pensylvanica), hobble bush (Viburnum alnifolium), and bearberry (Vaccinium erythrocarpum).

Disturbance Description

Fire Regime Group V. Fire disturbances are severe and affect large patch sizes but are very rare, at 300 to

*Dominant and Indicator Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.

1,000-year intervals; wind events are much more frequent at intervals of 100 to 200 years. Other disturbances, including windthrow, insect attack, and ice storms, usually on a single-tree-gap scale, were much more important than fire although they may have pre-disposed the forest to fire during drought conditions. In modern times other disturbances, especially logging, logging slash fires, balsam woolly adelgid (an exotic species), acid deposition, and climate change, are playing an important role.

Hurricanes are occasional causes of relatively large windthrow areas. They were/are probably 50-100 year interval events within small sections of the region. It should be noted that any windthrow events on the declining spruce-fir forest can be locally significant.

Adjacency or Identification Concerns

Scale Description

Sources of Scale Data ☐ Literature ☐ Local Data ☐ Expert Estimate

Issues/Problems

Model Evolution and Comments

Model is the same as FRCC model ESPF1, with no changes. This description is also based on the description doc for FRCC model ESPF1, with very minor changes made to the range: Frasier fir does not extend into the northeastern states, but this type is present in the very southern extent of RA Region 7 in the Appalachians in WV and VA.
It is possible that human caused (anthropogenic) fires are more important than natural fires. Further, it is presumed that some openings observed by settlers involved Indian activity (J. Dan Pittillo).
Model assumption: Native American fire was considered but not determined to be a significant factor.

Peer Review of the FRCC model was provided by Bill Patterson III (wap@forwild.umass.edu), University of Massachusetts Amherst, Amherst, MA, at Milwaukee, WI: 20 July, 2004.

Peer reviewed by J. Dan Pitillo, W. Carolina University, 04/26/05 and Erin Small.

Succession Classes

Succession classes are the equivalent of "Vegetation Fuel Classes" as defined in the Interagency FRCC Guidebook (www.frcc.gov).

Class A 15 %

Model All Structures

Description

Young stand co-dominated by hardwoods; less than approximately 30 yrs old.

Indicator Species* and Canopy Position

BEAL2	Upper
PRPE2	Upper
ACSP2	Mid-Upper
PIRU	Low-Mid

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 8

Structure Data (for upper layer lifeform)

	Min	Max
Cover	10 %	90 %
Height	Tree Regen <5m	Tree Short 5-9m
Tree Size Class	Sapling >4.5ft; <5"DBH	

☐ Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

*Dominant and Indicator Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.

Class B 30 %

Mid1 Closed

Description

Mature stand dominated by spruce and/or fir, approximately 30 - 100 yrs old.

Indicator Species* and Canopy Position

PIRU	Upper
ABFR	Upper
BEAL2	Mid-Upper

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 5

Structure Data (for upper layer lifeform)

	Min	Max
Cover	60 %	100 %
Height	Tree Short 5-9m	Tree Medium 10-24m
Tree Size Class	Pole 5-9" DBH	

☐ Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

Class C 55 %

Late1 Closed

Description

Old-growth stand dominated by spruce, generally over 100 yrs old.

Indicator Species* and Canopy Position

PIRU	Mid-Upper
BEAL2	Upper

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 5

Structure Data (for upper layer lifeform)

	Min	Max
Cover	60 %	90 %
Height	Tree Short 5-9m	Tree Tall 25-49m
Tree Size Class	Medium 9-21"DBH	

☐ Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

Class D 0 %

Late1 All Structures

Description

Indicator Species* and Canopy Position

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	0 %
Height	no data	no data
Tree Size Class	no data	

☐ Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

Class E 0 %

Late1 All Structures

Description

Indicator Species* and Canopy Position

Structure Data (for upper layer lifeform)

	Min	Max
Cover	%	%
Height	no data	no data
Tree Size Class	no data	

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*Dominant and Indicator Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☐ Tree

☐ Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

Fuel Model no data

Disturbances

Non-Fire Disturbances Modeled

- ☐ Insects/Disease
- ☑ Wind/Weather/Stress
- ☐ Native Grazing
- ☐ Competition
- ☐ Other:
- ☐ Other:

Fire Regime Group: **5**

I: 0-35 year frequency, low and mixed severity
II: 0-35 year frequency, replacement severity
III: 35-200 year frequency, low and mixed severity
IV: 35-200 year frequency, replacement severity
V: 200+ year frequency, replacement severity

Historical Fire Size (acres)

Avg:
Min:
Max:

Fire Intervals (FI):
Fire interval is expressed in years for each fire severity class and for all types of fire combined (All Fires). Average FI is the central tendency modeled. Minimum and maximum show the relative range of fire intervals, if known. Probability is the inverse of fire interval in years and is used in reference condition modeling. Percent of all fires is the percent of all fires in that severity class. All values are estimates and not precise.

Sources of Fire Regime Data

- ☑ Literature
- ☐ Local Data
- ☑ Expert Estimate

	Avg FI	*Min FI*	*Max FI*	*Probability*	*Percent of All Fires*
Replacement	500	300	1000	0.002	99
Mixed					
Surface					
All Fires	500			0.00202	

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